

REMARKS

In response to the above Office Action, the claims have been amended to change “whipped cream mixture” back to “foamed mixture” to avoid the rejection of the claims under §112, second paragraph.

In addition, claim 1 has been amended for clarity and to include the features of

- 1) heating the mixture charged to the molding space to evaporate moisture therein and
- 2) charging the mixture to the mold space “such that the distribution of foam within the aggregate granular material and the moisture content of the binder are concentrated in a center portion of the mold.” Support for 1) can be found on page 9, lines 9 and 10 where it is described that the molding space into which the foamed mixture is charged is at 250°C and for 2) on page 6, lines 12-24 and the description of step 2 of the molding process.

In the casting process of the present invention, one or more kinds of an aggregate granular material, one or more kinds of a water-soluble binder, and water, are mixed together to form a mixture of the aggregate granular material. The mixture is then agitated to cause it to foam such that it is formed as a foamed mixture. The foamed mixture is then charged into a molding space where it is hardened therein, so as to make a mold.

The foamed mixture is charged such that the distribution of foam within the aggregate granular material and the moisture content of the binder are concentrated at the center portion of the mold. Thus after the moisture evaporates therefrom, the center portion of the mold has a lower density of the charged aggregate granular material than outer portions of the mold. Consequently, the binder is concentrated in the outer portion of the mold. For example, if the resulting mold is about 40 mm thick, more than 50% of

the water-soluble binder is aggregated to a surface layer between the surface of the mold and a depth of 10 mm therefrom. See page 6, lines 12-24 of the specification. Then when a molten metal having a high temperature (e.g. 720°C) is poured into the completed mold, the binder in the mold readily volatilizes or dissolves making it easier to remove the mold from the cast article made from the molten metal. See page 9, lines 19-25 of the specification.

In the Office Action the Examiner continued to reject claims 1-7 and 12 over 35 U.S.C. §103(a) for being obvious over AAPA in view of Hitachi. In making this rejection the examiner acknowledges that AAPA neither teaches 1) that the binder is water-soluble and is either a polyvinyl alcohol (PBA) or starch or a derivative thereof or 2) that the mixture of aggregate granular material, binder and water are stirred (agitated) “to cause the mixture to foam and form a foamed mixture” page 3, last two lines to page 4, first two lines of the Office Action. “Stirring” has been changed to “agitating” in claim 1 (see abstract of WO 2005/080023) since a “foamed mixture” can be formed by other than simply “stirring.”

Hitachi is cited to show the use of water-soluble PVA in a method for making a casting. Thus the Examiner believes it would be obvious to use PVA in the process described in AAPA. However, it is further acknowledged that Hitachi does not show that this aggregate mixture is to be agitated to make it “foam” and form a “foamed mixture.” Nevertheless, the Examiner takes the position that since the process and ingredients are “the same,” when mixing the mixture of AAPA as modified by Hitachi, it will “foam.”

However, this is not true. AAPA and Hitachi only disclose mixing the ingredients of the mixture. Note the first paragraph of the English abstract of Hitachi where it is

disclosed that the ingredients are simply “mixed.” Mixing or agitating it to cause the mixture to “foam” and form a “foamed mixture” is different. The former will result in mixture that will be essentially homogeneous and consistent throughout when it is charged into a molding space. In contrast, and as now set forth in claim 1, when a “foamed mixture” is charged to a molding space the foam and moisture content of the binder will be concentrated in a center portion of the mold. Thus after the moisture is evaporated from the mixture, the center portion of the mold will have a lower density of the charged aggregate granular material than outer portions of the mold. Consequently, the binder will be more concentrated in the outer portions of the mold making it easier to remove the mold after casting an article in it with hot molten metal as described above. In summary, “foaming” the mixture of aggregate granular material, binder and water results in a different distribution of the ingredients in the resulting mold than would happen if they were simply “mixed” and provides advantages in the subsequent casting of metal articles in the mold.

Accordingly, since neither AAPA nor Hitachi disclose mixing the ingredients to actually form a “foamed mixture” as admitted by the Examiner, and Applicants have explained that definite and concrete advantages result from foaming the mixture as opposed to simply mixing it, it cannot be said that foaming is inherently taught by these references. Contrary to the Examiner’s comments, as discussed above, the claimed prior art products are inherently not identical or substantially identical and are not produced by identical or substantially identical processes because a “foamed mixture” is not the same as simply a “mixture.”

Withdrawal of the rejection of claims 1-7 and 12 over AAPA in view of Hitachi under §103(a) is therefore requested.

The Examiner also rejected claims 1, 12 and 13 over AAPA in view of Hoult. Hoult may show the use of starch as a water-soluble binder, but it like Hitachi also fails to teach that the mixture of particulate material, water and starch are mixed or agitated "to cause the mixture to foam and form a foamed mixture." Rather, as is disclosed in the reference, the mixture is simply "mixed." See column 1, lines 25-28 of Hoult.

Accordingly, it is believed claims 1, 12 and 13 are also not obvious over AAPA in view of Hoult for the same reasons claim 1 is not obvious over AAPA in view of Hitachi. Its withdrawal as a ground of rejection under § 103(a) is therefore requested.

It is believed claims 1-7, 12 and 13 are now in condition for allowance. If so, it would appear appropriate to rejoin withdrawn claims 8-11 since they all are dependent from claim 1.

An RCE is being filed with this Reply to enable the Examiner to consider the amended claims at this time.

In view of the foregoing remarks, Applicants submit that this claimed invention, as amended, is neither anticipated nor rendered obvious in view of the prior art references cited against this application. Applicants therefore request the entry of this Amendment, the Examiner's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account 06-0916.

Respectfully submitted,

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Dated: May 3, 2010

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